DIGITAL GAME DEVELOPMENT CURRICULUM FRAMEWORK

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INTRODUCTION

The Nevada CTE Curriculum Frameworks are a resource for Nevada's public and charter schools to design, implement, and assess their CTE programs and curriculum. The content standards identified in this document are listed as a model for the development of local district programs and curriculum. They represent rigorous and relevant expectations for student performance, knowledge, and skill attainment which have been validated by industry representatives.

The intent of this document is to provide a resource to districts as they develop and implement CTE programs and curricula.

This program ensures the following thresholds are met:

- The CTE course and course sequence teaches the knowledge and skills required by industry through applied learning methodology and, where appropriate, work-based learning experiences that prepare students for careers in high-wage, high-skill and/or high-demand fields. Regional and state economic development priorities shall play an important role in determining program approval. Some courses also provide instruction focused on personal development.
- The CTE course and course sequence includes leadership and employability skills as an integral part of the curriculum.
- The CTE course and course sequence are part of a rigorous program of study and include sufficient technical challenge to meet state and/or industry-standards.

The CTE program components include the following items:

- Program of Study
- State Skill Standards
- Employability Skills for Career Readiness Standards
- Curriculum Frameworks
- Technical Assessment
- Certification of Program Completion

The Nevada CTE Curriculum Frameworks are organized utilizing the recommended course sequencing listed in the Program of Study and the CTE Course Catalog. The framework identifies the recommended content standards, performance standards, and performance indicators that should be taught in each course.

NEVADA DEPARTMENT OF EDUCATION
CURRICULUM FRAMEWORK FOR
DIGITAL GAME DEVELOPMENT

PROGRAM TITLE:	**DIGITAL GAME DEVELOPMENT**
STATE SKILL STANDARDS:	**DIGITAL GAME DEVELOPMENT**
STANDARDS REFERENCE CODE:	**DGD**
CAREER CLUSTER:	**INFORMATION TECHNOLOGY**
CAREER PATHWAY:	**PROGRAMMING & SOFTWARE DEVELOPMENT**
PROGRAM LENGTH:	**3 LEVELS (L1, L2, L3C)**
PROGRAM ASSESSMENTS:	**DIGITAL GAME DEVELOPMENT** **WORKPLACE READINESS SKILLS**
CTSO:	**FBLA / SKILLSUSA**
GRADE LEVEL:	**9-12**
AVAILABLE INDUSTRY CERTIFICATIONS/LICENSES PROVIDERS:	**ADOBE CERTIFIED ASSOCIATE** **ADOBE**

PROGRAM PURPOSE

The purpose of this program is to prepare students for postsecondary education and employment in the Digital Game Development industry.

The program includes the following state standards:

- Nevada CTE Skill Standards: Digital Game Development
- Employability Skills for Career Readiness
- Common Core State Standards (alignment shown in the Nevada CTE Skill Standards)
- Nevada State Science Standards (alignment shown in the Nevada CTE Skill Standards)
- Common Career Technical Core (alignment shown in the Nevada CTE Skill Standards)

CAREER CLUSTERS

The National Career Clusters™ Framework provides a vital structure for organizing and delivering quality CTE programs through learning and comprehensive programs of study (POS). In total, there are 16 Career Clusters in the National Career Clusters™ Framework, representing more than 79 Career Pathways to help students navigate their way to greater success in college and career. As an organizing tool for curriculum design and instruction, Career Clusters™ provide the essential knowledge and skills for the 16 Career Clusters™ and their Career Pathways.*

*Cite: National Association of State Directors of Career Technical Education Consortium. (2012). Retrieved from http://www.careertech.org/career-clusters/glance/careerclusters.html

PROGRAM OF STUDY

The program of study illustrates the sequence of academic and career and technical education coursework that is necessary for the student to successfully transition into postsecondary educational opportunities and employment in their chosen career path.

CAREER AND TECHNICAL STUDENT ORGANIZATIONS (CTSO)

To further the development of leadership and technical skills, students must have opportunities to participate in one or more of the Career and Technical Student Organizations (CTSOs). CTSOs develop character, citizenship, and the technical, leadership and teamwork skills essential for the workforce and their further education. Their activities are considered a part of the instructional day when they are directly related to the competencies and objectives in the course. (per NAC 389.800 section 3a)

PROGRAM STRUCTURE

The core course sequencing provided in the following table serves as a guide to schools for their programs of study. Each course is listed in the order in which it should be taught and has a designated level. Complete program sequences are essential for the successful delivery of all state standards in each program area.

DIGITAL GAME DEVELOPMENT Core Course Sequence	
COURSE NAME	**LEVEL**
Digital Game Development I	L1
Digital Game Development II	L2
Digital Game Development III	L3C

The core course sequencing with the complementary courses provided in the following table serves as a guide to schools for their programs of study. Each course is listed in the order in which it should be taught and has a designated level. A program does not have to utilize all of the complementary courses in order for their students to complete their program of study. Complete program sequences are essential for the successful delivery of all state standards in each program area.

DIGITAL GAME DEVELOPMENT Core Course Sequence with Complementary Courses	
COURSE NAME	**LEVEL**
Digital Game Development I	L1
Digital Game Development II	L2
Digital Game Development II LAB*	L2L
Digital Game Development III	L3C
Digital Game Development III LAB*	L3L
Digital Game Development Advanced Studies*	AS

*Complementary Courses

EMPLOYABILITY SKILLS FOR CAREER READINESS

Employability skills, often referred to as "soft skills", have for many years been a recognizable component of the standards and curriculum in career and technical education programs. The twenty-one standards are organized into three areas: (1) Personal Qualities and People Skills; (2) Professional Knowledge and Skills; and (3) Technology Knowledge and Skills. The standards are designed to ensure students graduate high school properly prepared with skills employers prioritize as the most important. Instruction on all twenty-one standards should be part of each course of the CTE program. Students are expected to demonstrate proficiency in the Employability Skills for Career Readiness upon completion of a CTE course sequence. (per NAC 389.800 section 1)

CTE / ACADEMIC CREDIT

Career and technical education courses meet the credit requirements for high school graduation (1 unit of arts and humanities or career and technical education). Some career and technical education courses meet academic credit for high school graduation. Please refer to the local high schools course catalog or contact the local high school counselor for more information. (per NAC 389.672)

TECHNICAL ASSESSMENT

An end-of-program technical assessment has been developed to align with the Nevada CTE Skill Standards for this program. This assessment provides a measurement of student technical skill attainment. Students who complete a program will be assessed on their skill attainment during the completion level course. Completion level courses are identified by the letter "C". (Level = L3C) (per NAC 389.800 section 1)

ARTICULATION

An articulation agreement is an officially approved agreement that matches coursework between the secondary and postsecondary institutions. These agreements are designed to help students make a smooth transition from secondary to postsecondary institutions. The articulation agreement identifies the specific courses that align and are accepted for credit at the postsecondary level.

Each local high school and college maintains their agreements. Please refer to the local high schools course catalog or contact the local high school counselor for more information.

CERTIFICATION OF PROGRAM COMPLETION

A student must be given a certificate upon completion of a course of study in an occupation which states the level of performance the pupil has attained in specific skills identified by representatives of business or industry. (per NAC 389.800 section 3b)

CTE GRADUATION ENDORSEMENT

A student qualifies for a CTE endorsement on their high school diploma after successfully completing the CTE program of study and meeting all academic requirements governing receipt of a standard diploma. (per NAC 389.815)

CORE COURSE:
RECOMMENDED STUDENT PERFORMANCE STANDARDS

COURSE TITLE:	**Digital Game Development I**
ABBR. NAME:	**DIG GAME DEV I**
CREDITS:	**1**
LEVEL:	**L1**
CIP CODE:	**50.0411**
PREREQUISITE:	**None**
CTSO:	**FBLA / SkillsUSA**

COURSE DESCRIPTION

This course is designed to introduce students to the elements and structure of game programming and design. The areas of major emphasis in the course are game methodology, programming, game genres, game theory, 2D and 3D interactive experiences, and immersive environments. Students will apply both creative and technical skills to design and refine in addition to implementing the adventure. The appropriate use of technology is an integral part of this course.

TECHNICAL STANDARDS

CONTENT STANDARD 1.0 : EXPLORE THE DIGITAL GAME INDUSTRY

Performance Standard 1.1 : History of the Game Development
Performance Indicators : 1.1.1-1.1.5
Performance Standard 1.2 : Understand Careers in Game Design and Development
Performance Indicators : 1.2.1-1.2.7
Performance Standard 1.3 : Demonstrate Knowledge of Industry Terminology
Performance Indicators : 1.3.1-1.3.4
Performance Standard 1.4 : Demonstrate Knowledge of Design Therories
Performance Indicators : 1.4.1-1.4.3

CONTENT STANDARD 2.0 : UNDERSTAND FOUNDATIONS OF GAME DESIGN AND DEVELOPMENT

Performance Standard 2.1 : Explain Fundamentals of Production
Performance Indicators : 2.1.1-2.1.5
Performance Standard 2.2 : Understand Game Structure
Performance Indicators : 2.2.1-2.2.6
Performance Standard 2.3 : Game Documentation
Performance Indicators : 2.3.1
Performance Standard 2.4 : Industry Standard Game Mechanics
Performance Indicators : 2.4.1-2.4.4

CONTENT STANDARD 3.0 : CREATE ASSETS FOR GAME DEVELOPMENT

Performance Standard 3.1 : Understand Fundamentals of Art
Performance Indicators : 3.1.1-3.1.9
Performance Standard 3.2 : Understand Environments in Game Design
Performance Indicators : 3.2.1-3.2.6
Performance Standard 3.3 : Develop a Character
Performance Indicators : 3.3.1-3.3.5
Performance Standard 3.4 : Create Game Art
Performance Indicators : 3.4.1-3.4.9

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Performance Standard 3.5 : Apply Animation to Game Assets
Performance Indicators : 3.5.1-3.5.3

CONTENT STANDARD 4.0 : UNDERSTAND PROGRAMMING FOR DIGITAL GAME DEVELOPMENT
Performance Standard 4.1 : Apply Logic to Game Development
Performance Indicators : 4.1.1-4.1.8
Performance Standard 4.2 : Understand Programming Language Concepts
Performance Indicators : 4.2.1-4.2.3, 4.2.7-4.2.11

CONTENT STANDARD 5.0 : BUILD A GAME
Performance Standard 5.1 : Explore 2D and 3D Game Engines
Performance Indicators : 5.1.1-5.1.4
Performance Standard 5.2 : Diagram Game Levels
Performance Indicators : 5.2.1-5.2.4
Performance Standard 5.3 : Utilize Graphical User Interface (GUI)
Performance Indicators : 5.3.1
Performance Standard 5.4 : Design Custom Mechanics
Performance Indicators : 5.4.1-5.4.2

CONTENT STANDARD 6.0 : UNDERSTAND LEGAL AND ETHICAL ISSUES IN GAME DESIGN AND DEVELOPMENT
Performance Standard 6.1 : Understand Copyright Laws in Relationship to Game Development
Performance Indicators : 6.1.1-6.1.4
Performance Standard 6.2 : Understand Security Issues in Relation to Game Development and Design
Performance Indicators : 6.2.1-6.2.3
Performance Standard 6.3 : Apply Personal and Professional Ethics
Performance Indicators : 6.3.1-6.3.2

EMPLOYABILITY SKILLS FOR CAREER READINESS STANDARDS

CONTENT STANDARD 1.0 : DEMONSTRATE EMPLOYABILITY SKILLS FOR CAREER READINESS
Performance Standard 1.1 : Demonstrate Personal Qualities and People Skills
Performance Indicators : 1.1.1-1.1.7
Performance Standard 1.2 : Demonstrate Professional Knowledge and Skills
Performance Indicators : 1.2.1-1.2.10
Performance Standard 1.3 : Demonstrate Technology Knowledge and Skills
Performance Indicators : 1.3.1-1.3.4

ALIGNMENT TO COMMON CORE AND STATE SCIENCE STANDARDS*

English Language Arts: Reading Standards for Literacy in Science and Technical Subjects
Writing Standards for Literacy in Science and Technical Subjects
Speaking and Listening
Writing

Mathematics: Mathematical Practices
Numbers & Quanity-Quanities
Functions-Building Functions
Statistics and Probability-Conditional Probablity and the Rules of Probablity

Science: Physical Science

***** Refer to the Digital Game Development Standards for alignment by performance indicator

CORE COURSE:
RECOMMENDED STUDENT PERFORMANCE STANDARDS

COURSE TITLE:	**Digital Game Development II**
ABBR. NAME:	**DIG GAME DEV II**
CREDITS:	**1**
LEVEL:	**L2**
CIP CODE:	**50.0411**
PREREQUISITE:	**Digital Game Development I**
CTSO:	**FBLA / SkillsUSA**

COURSE DESCRIPTION

This course is a continuation of Digital Game Development I. This course provides intermediate digital game development students with instruction in advanced techniques and processes. The areas of major emphasis in the course will be implemented in immersive environments and will include development of the student's individual genre of choice and to explore the potential for multi-genre development. Students will apply both creative and technical skills to design and refine in addition to implementing the adventure. The appropriate use of technology and industry-standard equipment is an integral part of this course.

TECHNICAL STANDARDS

CONTENT STANDARD 2.0 : UNDERSTAND FOUNDATIONS OF GAME DESIGN AND DEVELOPMENT

Performance Standard 2.1 : Explain Fundamentals of Production
Performance Indicators : 2.1.4-2.1.11
Performance Standard 2.2 : Understand Game Structure
Performance Indicators : 2.2.3-2.2.8
Performance Standard 2.3 : Game Documentation
Performance Indicators : 2.3.1-2.3.3
Performance Standard 2.4: Industry Standard Game Mechanics
Performance Indicators : 2.4.3-2.4.4

CONTENT STANDARD 3.0 : CREATE ASSETS FOR GAME DEVELOPMENT

Performance Standard 3.2 : Understand Environments in Game Design
Performance Indicators : 3.2.6-3.2.7
Performance Standard 3.3 : Develop a Character
Performance Indicators : 3.3.1-3.3.6
Performance Standard 3.4 : Create Game Art
Performance Indicators : 3.4.1-3.4.10
Performance Standard 3.5 : Apply Animation to Game Assets
Performance Indicators : 3.5.4-3.5.17

CONTENT STANDARD 4.0 : UNDERSTAND PROGRAMMING FOR DIGITAL GAME DEVELOPMENT

Performance Standard 4.2 : Understand Programming Language Concepts
Performance Indicators : 4.2.4-4.2.14
Performance Standard 4.3 : Algorithms
Performance Indicators : 4.3.1-4.3.5

CONTENT STANDARD 5.0 : BUILD A GAME

Performance Standard 5.1 : Explore 2D and 3D Game Engines
Performance Indicators : 5.1.4

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Performance Standard 5.2 : Diagram Game Levels
Performance Indicators : 5.2.1-5.2.6
Performance Standard 5.3 : Utilize Graphical User Interface (GUI)
Performance Indicators : 5.3.1-5.3.4
Performance Standard 5.4 : Design Custom Mechanics
Performance Indicators : 5.4.1-5.4.5
Performance Standard 5.5: Integrate Media Types
Performance Indicators : 5.5.1-5.5.4

CONTENT STANDARD 6.0 : UNDERSTAND LEGAL AND ETHICAL ISSUES IN GAME DESIGN AND DEVELOPMENT

Performance Standard 6.3 : Apply Personal and Professional Ethics
Performance Indicators : 6.3.3-6.3.4

CONTENT STANDARD 7.0 : PUBLISHING THE GAME

Performance Standard 7.1 : Target Platforms
Performance Indicators : 7.1.1-7.1.3
Performance Standard 7.2 : Marketing a Game
Performance Indicators : 7.2.1

EMPLOYABILITY SKILLS FOR CAREER READINESS STANDARDS

CONTENT STANDARD 1.0 : DEMONSTRATE EMPLOYABILITY SKILLS FOR CAREER READINESS

Performance Standard 1.1 : Demonstrate Personal Qualities and People Skills
Performance Indicators : 1.1.1-1.1.7
Performance Standard 1.2 : Demonstrate Professional Knowledge and Skills
Performance Indicators : 1.2.1-1.2.10
Performance Standard 1.3 : Demonstrate Technology Knowledge and Skills
Performance Indicators : 1.3.1-1.3.4

ALIGNMENT TO COMMON CORE AND STATE SCIENCE STANDARDS*

English Language Arts: Reading Standards for Literacy in Science and Technical Subjects
Writing Standards for Literacy in Science and Technical Subjects
Speaking and Listening
Writing

Mathematics: Mathematical Practices
Statistics and Probablitiy
Algebra-Creating Equations
Geometry-Modeling with Geometry

Science: Physical Science

***** Refer to the Digital Game Development Standards for alignment by performance indicator

CORE COURSE:
RECOMMENDED STUDENT PERFORMANCE STANDARDS

COURSE TITLE:	**Digital Game Development III**
ABBR. NAME:	**DIG GAME DEV III**
CREDITS:	**1**
LEVEL:	**L3C**
CIP CODE:	**50.0411**
PREREQUISITE:	**Digital Game Development II**
PROGRAM ASSESSMENTS:	**DIGITAL GAME DEVELOPMENT** **WORKPLACE READINESS SKILLS**
CTSO:	**FBLA / SkillsUSA**

COURSE DESCRIPTION

This course is a continuation of Digital Game Development II. This course provides advanced digital game development students with instruction in advanced techniques and processes. Emphasis is placed on students developing sophisticated digital games that include intermediate and advanced concepts in design, programming, animation, and 3-D techniques. Project-based learning, collaboration, and portfolio development are essential elements of this course. The appropriate use of technology and industry-standard equipment is an integral part of this course. Upon successful completion of this course, students will have acquired entry-level skills for employment and be prepared for postsecondary education.

TECHNICAL STANDARDS

CONTENT STANDARD 2.0 : UNDERSTAND FOUNDATIONS OF GAME DESIGN AND DEVELOPMENT

Performance Standard 2.1 : Explain Fundamentals of Production
Performance Indicators : 2.1.6-2.1.13
Performance Standard 2.2 : Understand Game Structure
Performance Indicators : 2.2.8
Performance Standard 2.3 : Game Documentation
Performance Indicators : 2.3.1-2.3.6
Performance Standard 2.4 : Industry Standard Game Mechanics
Performance Indicators : 2.4.4

CONTENT STANDARD 3.0 : CREATE ASSETS FOR GAME DEVELOPMENT

Performance Standard 3.2 : Understand Environments in Game Design
Performance Indicators : 3.2.6-3.2.7
Performance Standard 3.3 : Develop a Character
Performance Indicators : 3.3.6
Performance Standard 3.4: Create Game Art
Performance Indicators : 3.4.1, 3.4.8
Performance Standard 3.5 : Apply Animation to Game Assets
Performance Indicators : 3.5.12-3.5.17

CONTENT STANDARD 4.0 : UNDERSTAND PROGRAMMING FOR DIGITAL GAME DEVELOPMENT

Performance Standard 4.2 : Understand Programming Language Concepts
Performance Indicators : 4.2.8-4.2.14
Performance Standard 4.3 : Algorithm
Performance Indicators : 4.3.1-4.3.6

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CONTENT STANDARD 5.0 : BUILD A GAME
Performance Standard 5.2 : Diagram Game Levels
Performance Indicators : 5.2.5-5.2.6
Performance Standard 5.3 : Utilize Graphical User Interface (GUI)
Performance Indicators : 5.3.4
Performance Standard 5.4 : Design Custom Mechanics
Performance Indicators : 5.4.1-5.4.5
Performance Standard 5.5: Integrate Media Types
Performance Indicators : 5.5.1-5.5.5
CONTENT STANDARD 6.0 : UNDERSTAND LEGAL AND ETHICAL ISSUES IN GAME DESIGN AND DEVELOPMENT
Performance Standard 6.3 : Apply Personal and Professional Ethics
Performance Indicators : 6.3.3-6.3.4
CONTENT STANDARD 7.0 : PUBLISHING THE GAME
Performance Standard 7.1 : Target Platforms
Performance Indicators : 7.1.3-7.1.4
Performance Standard 7.2 : Marketing a Game
Performance Indicators : 7.2.1-7.2.7
CONTENT STANDARD 8.0 : EXPLORE EMERGING TECHNOLOGIES
Performance Standard 8.1 : Understand Social Aspects of Gaming
Performance Indicators : 8.1.1-8.1.3
Performance Standard 8.2 : Understand the Role of Networking
Performance Indicators : 8.2.1-8.2.2
Performance Standard 8.3 : Explore Advances in Devices
Performance Indicators : 8.3.1-8.3.3

EMPLOYABILITY SKILLS FOR CAREER READINESS STANDARDS

CONTENT STANDARD 1.0 : DEMONSTRATE EMPLOYABILITY SKILLS FOR CAREER READINESS
Performance Standard 1.1 : Demonstrate Personal Qualities and People Skills
Performance Indicators : 1.1.1-1.1.7
Performance Standard 1.2 : Demonstrate Professional Knowledge and Skills
Performance Indicators : 1.2.1-1.2.10
Performance Standard 1.3 : Demonstrate Technology Knowledge and Skills
Performance Indicators : 1.3.1-1.3.4

ALIGNMENT TO COMMON CORE AND STATE SCIENCE STANDARDS*

English Language Arts: Reading Standards for Literacy in Science and Technical Subjects
Writing Standards for Literacy in Science and Technical Subjects
Speaking and Listening

Mathematics: Mathematical Practices
Functions-Building Functions
Algebra-Reasoning with Equations and Inequities
Statistics and Probablity-Making Inferences & Justifing Conclusions

Science: Physical Science

***** Refer to the Digital Gaming Development Standards for alignment by performance indicator

COMPLEMENTARY COURSE(S):

Programs that utilize the complementary courses can include the following courses. The Advanced Studies course allows for additional study through investigation and in-depth research.

COURSE TITLE:	**Digital Game Development Advanced Studies**
ABBR. NAME:	**DIG GAME DEV AS**
CREDITS:	**1**
LEVEL:	**AS**
CIP CODE:	**50.0411**
PREREQUISITE:	**Digital Game Development III**
CTSO:	**FBLA / SkillsUSA**

COURSE DESCRIPTION

This course is offered to students who have achieved all content standards in a program whose desire is to pursue advanced study through investigation and in-depth research. Students are expected to work independently or in a team and consult with their supervising teacher for guidance. The supervising teacher will give directions, monitor, and evaluate the students' topic of study. Coursework may include various work-based learning experiences such as internships and job shadowing, involvement in a school-based enterprise, completion of a capstone project, and/or portfolio development. This course may be repeated for additional instruction and credit.

TECHNICAL STANDARDS

Students have achieved all program content standards and will pursue advanced study through investigation and in-depth research.

EMPLOYABILITY SKILLS FOR CAREER READINESS STANDARDS

Students have achieved all program content standards and will pursue advanced study through investigation and in-depth research.

SAMPLE TOPICS

- Internship
- Capstone Project
- Portfolio
- Class Project Manager
- Teaching Assistant
- CTSO Leaderhip

COMPLEMENTARY COURSE(S):
RECOMMENDED STUDENT PERFORMANCE STANDARDS

Programs that utilize the complementary courses can include the following courses. The lab courses allow additional time to be utilized in developing the processes, concepts, and principles as described in the classroom instruction. The standards and performance indicators for each lab course are shown in the corresponding course listed in the previous section.

COURSE TITLE:	**Digital Game Development II LAB**
ABBR. NAME:	**DIG GAME DEV II L**
CREDITS:	**1**
LEVEL:	**L2L**
CIP CODE:	**50.0411**
PREREQUISITE:	**Concurrent enrollment in Digital Game Development II**
CTSO:	**FBLA / SkillsUSA**

COURSE DESCRIPTION

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth lab experience that applies the processes, concepts, and principles as described in the classroom instruction. The coursework will encourage students to explore and develop advanced skills in their program area. The appropriate use of technology and industry-standard equipment is an integral part of this course.

COURSE TITLE:	**Digital Game Development III LAB**
ABBR. NAME:	**DIG GAME DEV III L**
CREDITS:	**1**
LEVEL:	**L3L**
CIP CODE:	**50.0411**
PREREQUISITE:	**Concurrent enrollment in Digital Game Development III**
CTSO:	**FBLA / SkillsUSA**

COURSE DESCRIPTION

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth lab experience that applies the processes, concepts, and principles as described in the classroom instruction. The coursework will encourage students to explore and develop advanced skills in their program area. The appropriate use of technology and industry-standard equipment is an integral part of this course.